

REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 1-21 are currently pending in this application. Claims 3-20 have been withdrawn from further consideration by the Examiner. No new matter has been added by way of the present amendment. For instance, new claim 21 is supported by the Specification at, for example, pages 9 and 15. Accordingly, no new matter has been added.

In view of the remarks herein, Applicants respectfully request that the Examiner withdraw all outstanding rejections and allow the currently pending claims.

Issues Under 35 U.S.C. § 103(a)

Claims 1 and 2 stand rejected under 35 U.S.C. 103(a) as being obvious over Awano (U.S. 7,084,507) (hereinafter Awano '507) in view of Webster (Wiley Encyclopedia of Electrical and Electronics Engineering).

The Examiner asserts that Awano '507 teaches "device formation of wiring structure including metal and an intervening carbon nanotube". The Examiner further asserts that "semiconductor material 202/204" and the metal do not directly contact each other, so that "[t]he carbon nanotube thus is employed for connection to device elements as well for interconnection therebetween".

The Examiner acknowledges that Awano '507 does not explicitly recite the use of a semiconductor material in which the device component includes an organic semiconductor material having a 6-membered carbon ring. However, the Examiner relies on Webster and argues

that it would be obvious to use an organic material having a 6-membered carbon ring as the "semiconductor material 202/204" of Awano '507.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, there must be a reason why one of ordinary skill in the art would modify the reference or combine reference teachings to obtain the invention. A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). There must be a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *Id.* The Supreme Court of the United States has recently held that the "teaching, suggestion, motivation test" is a valid test for obviousness, albeit one which cannot be too rigidly applied. *Id.* Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *Id.*

Applicants submit that the the Examiner's rejection is based on a misunderstanding of the teachings of Awano '507. Awano '507 is directed to an integrated circuit device having vias for interconnecting wiring lines in separate layers, wherein the vias are made of nanotubes. Figure 19C of Awano '507, on which the Examiner relies to support his assertion that Awano '507 teaches the presently claimed device, teaches a drain electrode 222 (which the Examiner argues is equivalent to the presently claimed "metal") formed above a plurality of carbon nanotubes 220. The carbon nanotubes 220 are formed over a p+ region 204 which is formed on an n-type

silicon substrate 202. The Examiner argues that elements 202 and 204 are a "semiconductor material" that is "not limited".

However, Applicants respectfully submit that Awano '507 explicitly discloses that p+ region 204 is formed by injecting As ions on the silicon substrate 202. Thus, based on the function of elements 202 and 204, it is evident that one skilled in the art would not have been motivated to utilize an organic material having a 6-membered carbon ring to form these elements, contrary to the Examiner's assertion.

Evidently, Awano '507 does not teach or suggest contacting a carbon nanotube with an organic material having a 6-membered carbon ring. Webster fails to cure these deficiencies. Webster merely discloses that organic materials have semiconductor properties and high electronic conductivity. Applicants submit that one skilled in the art, faced with the teachings of Awano '507 and Webster, would not have arrived at the present invention.

Because the invention, as set forth in Applicants' claims, is not disclosed or made obvious by the cited prior art, reconsideration and withdrawal of this rejection are respectfully requested.

Miscellaneous

Applicants respectfully note that the Examiner has failed once again to address the arguments presented on October 30, 2006 with regards to the withdrawal of claims 3-20. These arguments are reproduced below for the Examiner's convenience.

The Examiner has withdrawn claims 3-20 from further consideration asserting that they relate to a non-elected species. Applicants respectfully disagree and request that the Examiner reconsider. Applicants point out that the inventive aspect of the elected invention relates to the

subject matter of claim 1. Moreover, even though the language of other claims (for instance independent claims 3 and 4) may differ, each of these claims essentially requires a carbon nanotube in contact with an organic material having a six-membered carbon ring and a metal in contact with a part of the carbon nanotube. Accordingly, based upon this related subject matter, Applicants submit that the Examiner should expand the consideration of the claims to claims 1-20. Therefore, rejoinder in this regard is respectfully requested.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and objections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Marc S. Weiner, Reg. No. 32,181 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 

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